REMARKS

Claim 4 has been canceled. Claims 5 and 6 have been amended. Accordingly, claims 5-7, 9 and 11 are pending in the application.

Claim Objections

Claim 11 stands objected to because of a repetitive error in line 10. Claim 11 has been amended to correct this error.

Claims Rejections under 35 USC § 102 and 35 USC § 103

Claims 4-6 and 11 stand rejected under 35 USC 102(b) as being anticipated by Bez, USP 5,482,443. Claim 4 has been canceled.

Claims 7 and 9 stand rejected under 35 USC 103(a) as being unpatentable over Sugiyama et al. USP 6,122,049 in view of Bez, USP 5,482,443, and further in view of Gerhardt et al. USP 6,712,587.

For the reasons set forth hereafter, it is submitted that claims 5-7, 9 and 11 are patentable.

Patentability of the Claims

Applicants' invention, as set forth in claim 11, is directed to a liquid chromatograph pump having an upstream-side plunger pump and a downstream-side plunger pump connected fluidly in series. A first check valve is arranged at an upstream side with respect to the upstream-side plunger pump. A second check valve is also claimed which is arranged between the upstream-side and the downstream-side plunger pump.

In claim 11, the second check valve is arranged between the upstream-side and downstream-side plunger pumps to allow the liquid to flow from the upstream-side plunger pump toward the downstream-side plunger pump when the plunger of the downstream-side plunger pump moves backward to take the liquid into the downstream-side plunger pump and the plunger of the upstream-side plunger pump moves forward to pressurize the liquid in the upstream-side plunger pump to make

the flow rate of the liquid discharged from the upstream-side plunger pump greater than the flow rate of the liquid stored in the downstream-side plunger pump.

In other words, the second check valve enables the upstream-side plunger pump to supply a total amount of the flow rate of the liquid taken into the downstream-side plunger pump and the flow rate of the liquid discharged from the downstream-side plunger pump to the outside of the liquid chromatograph pump.

With respect to the cited prior art, the Bez '443 patent is directed to a multistage vacuum pump utilizing a single piston and cylinder assembly. In the multistage vacuum pump of Bez, the check valve 108 (indicated by the Examiner in the Office Action to correspond to the second check valve of claim 11) is arranged between the second pump stage and the third pump stage to allow the gas to flow from the second pump stage to the third pump stage when the enlarged diameter portion 76 moves upward. In Bez, however, the enlarged diameter portion having the identical diameter for both the second and third stages and driven at the identical velocity for both of the second and third stages cannot make the flow rate of the liquid discharged from the upstream-side plunger pump greater than the flow rate of the liquid stored in the downstream-side plunger pump.

The liquid chromatograph pump in the claimed invention of the present application needs to continuously discharge the liquid without interruption of the liquid discharge, but the vacuum pump as disclosed by Bez does not need to discharge the gas continuously. In other words, a function necessary for the check valve between the pump stages in the vacuum pump. Thus, the vacuum pump of Bez does not anticipate nor render obvious the claimed invention of the present application relating to the liquid chromatograph pump. Therefore, claim 11 and claims 5-7 and 9 depending therefrom are patentable over Bez.

With respect to the cited Sugiyama et al. '049 and Gerhardt et al. '587 patents, Sugiyama et al., is directed to a liquid chromatographic apparatus having a flow cell provided with a cell body having an inlet flow passage, a detection flow passage, an outlet flow passage and windows fixed to the cell body on both sides of the detection flow passage. Gerhardt et al., is directed to a hydraulic amplifier

system for an ultra-high pressure liquid chromatography system which includes a hydraulic cylinder comprising a primary piston chamber in which a primary piston is disposed and a secondary piston chamber in which a secondary piston is disposed.

Neither of patents, taken alone or in combination with Bez, render any of claims 11, 5-7 and 9 unpatentable. These claims therefore should be allowed.

Conclusion

In view of the foregoing, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 500.43232X00).

Respectfully submitted,

Gene W. Stockman

Gene W. Stockman
Registration No. 21,021

GWS/na
MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 Diagonal Rd., Suite 370
Alexandria, Virginia 22314
(703) 684-1120
Date: October 31, 2007